

SEQUENCE LISTING**SEQ ID NO:1 Synthetic Sso7d gene**

GCAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAGAGGTAGACATCTCCAA
 5 GATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCCTCACCTACGACGAGGG
 CGGTGGCAAGACCGGCCGTGGTCGGTAAGCGAAAAGGACGCGCCGAAGGAGC
 TGCTGCAGATGCTGGAGAAG
 CAGAAAAAG

10 SEQ ID NO:2 The amino acid sequence of Sso7d.

ATVKFKYKGEEKEVDISKIKKVVWRVGKMISFTYDEGGGKTGRGAVSEKDAPKELLQ
 MLEKQKK

SEQ ID NO:3 The DNA sequence encoding the Sso7d-ΔTaq fusion protein

15 ATGATTACGAATTGAGCGAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAA
 GAGGTAGACATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCC
 TTCACCTACGACGAGGGCGGTGGCAAGACCGGCCGTGGTCGGTAAGCGAAAAG
 GACGCGCCGAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGGGCGGCCGG
 TGTCACTAGTCCCAGGCcCTGGAGGAGGCCCTGGCCCCCGCCGAAGGGGCC
 20 TTCGTGGCTTGCTTCCGCAAGGAGCCATGTGGCCGATCTTCTGGCCCT
 GGCGCCGCCAGGGGGGGCCGGTCCACCGGGCCCCGAGCCTTATAAAGCCCT
 CAGGGACCTGAAGGAGGAGCGGGGGCTTCTGCCAAAGACCTGAGCGTTCTGGC
 CCTGAGGGAAGGCCTTGGCTCCCGCCGGCGACGACCCATGCTCCTCGCCTAC
 CTCCTGGACCCTTCCAACACCACCCCGAGGGGGTGGCCCGCGCTACGGCGGG
 25 GAGTGGACGGAGGAGGCAGGGGGAGCGGGCCCTTCCGAGAGGCTTACCGGGAG
 AACCTGTGGGGAGGCTTGAGGGGGAGGAGAGGCTCCTTGGCTTACCGGGAG
 GTGGAGAGGCCCTTCCGCTGTCCTGGCCCACATGGAGGCCACGGGGTGC
 CTGGACGTGGCTATCTCAGGGCCTGTCCTGGAGGTGGCCGAGGAGATCGCCC
 GCCTCGAGGCCGAGGTCTCCGCTGGCCGCCACCCCTAACCTCAACTCCG
 30 GGACCAGCTGAAAGGGCTCTTGTACGAGCTAGGGCTCCGCCATGGCAA
 GACGGAGAAGACCGCAAGCGCTCCACCAGCGCCGCCGTGGAGGCCCTCCG
 CGAGGCCACCCATCGTGGAGAAGATCCTGCAGTACCGGGAGCTACCAAGCT
 GAAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCAGGACGGCG
 CCTCCACACCCGCTCAACCAGACGGCACGGCACGGCAGGCTAAGTAGCTC

CGATCCAACCTCCAGAACATCCCCGTCCGACCCCGCTTGGCAGAGGATCCGC
 CGGGCCTTCATCGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAGCCAG
 ATAGAGCTCAGGGTGCTGGCCACCTCTCCGGCAGCAGAACCTGATCCGGGTCT
 TCCAGGAGGGCGGGACATCCACACGGAGACCGCCAGCTGGATGTTGGCGTCC
 5 CCCGGGAGGCCGTGGACCCCTGATGCGCCGGCGGCCAAGACCATACTTCG
 GGGTCCTCTACGGCATGTCGGCCACCGCCTCTCCCAGGAGCTAGCCATCCCTTA
 CGAGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTTCCAAAGGTGCGG
 GCCTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCCGGTACGTGGAGAC
 CCTCTCGGCCGCCGCTACGTGCCAGACCTAGAGGCCGGTGAAGAGCGT
 10 CGGGGAGGCCGTGGACCCCTGATGCGCCAGGGCACCGCCGC
 CGACCTCATGAAGCTGGCTATGGTGAAGCTCTCCCAAGGCTGGAGGAAATGGG
 GCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGCCTCGAGGCCAAAAGA
 GAGGGCGGAGGCCGTGGCCCGCTGCCAAGGAGGTATGGAGGGGTGTATCC
 CCTGGCCGTGCCCTGGAGGTGGAGGTGGATAGGGAGGACTGGCTCTCCGC
 15 CAAGGAGGGCATTGATGGCCGCCGGAGGCCGATCATCATCATCATCATCAT
 A

SEQ ID NO:4 The amino acid sequence of Sso7d-ΔTaq fusion protein

MITNSSATVKFKYKGEKEVDISKIKKVWRVGKMISFTYDEGGGKTGRGA VSEKDA
 20 PKELLQMLEKQKKGGVTSPKALEEAPWPPPEGAFVGFLSRKEPMWADLLALAA
 ARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREGLGLPPGDDPMLLAYLLDP
 SNTTPEGVARRYGGEWTEEAGERAALSERLFANLWGRLEGEERLLWLYREVERPLS
 AVLAHMEATGVRLDVAYLRALSLEVAAEIIARLEAEVFRLAGHPFNLNSRDQLERVLF
 DELGLPAIGKTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTYIDPLPDLIH
 25 PRTGRLHTRFNQTATATGRLSSSDPNLQNIPVRTPLGQRIRRAFIAEEGWLLVALDYS
 QIELRVLAHLSGDENLIRVFQEGRDIHTETASWMFGVPREAVDPLMRRAAKTINFGV
 LYGMSAHLRSQELAIPYEEAQAFIERYFQSFPKVRAWIEKTLEEGRRRGYVETLFGR
 RYVPDLEARVKSvreAAERMAFNMPVQGTAADLMKLAMVKLFPRLEEMGARMLL
 QVHDELVLEAPKERAEEAVARLAKEVMEGVYPLAVPLEEVGIGEDWLSAKEGIDGR
 30 GGGGHHHHHH

SEQ ID NO:5 The DNA sequence encoding the Sso7d-Taq fusion protein

ATGATTACGAATTCGAGCGAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAA

GAGGTAGACATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCC
TTCACCTACGACGAGGGCGGTGGCAAGACCGGCCGTGGTGCCTGAAGCGAAAAG
GACGCCGAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGGGCGGCCGG
TGTCACTAGTGGATGCTGCCCTTTGAGCCAAGGGCGGGTCTCCTGGT
5 GACGCCACCACCTGGCCTACCGCACCTCCACGCCCTGAAGGGCCTCACCA
GCCGGGGGGAGCCGGTGCAGGCCTACGGCTGCCAAGAGCCTCCTCAAGG
CCCTCAAGGAGGACGGGACGCCGGTACGGGTTACAAGGCCAGGGCCCC
CCTCCGCCACGAGGCCTACGGGGTACAAGGCCAGGGCCCCAGGCCAG
AGGACTTTCCCCGGCAACTGCCCTCATCAAGGAGCTGGTGGACCTCCTGGGCT
10 GGCGGCCCTCGAGGTCCCGGGTACGAGGCGGACGACGTCTGGCAGCCTGGC
CAAGAAGGCGAAAAGGAGGGTACGAGGTCCGCATCCTCACCGCCGACAAAG
ACCTTACCAAGCTCCTTCCGACCGCATCCACGTCCACCCGAGGGTACCT
CATCACCCGGCCTGGCTTGGAAAAGTACGGCTGAGGCCGACAGTGGC
CGACTACCGGGCCCTGACCGGGGACGAGTCCGACAACCTCCCAGGGTCAAGGG
15 CATCGGGGAGAAGACGGCGAGGAAGCTCTGGAGGAGTGGGGAGCCTGGAAG
CCCTCCTCAAGAACCTGGACCGGCTGAAGCCGCCATCCGGAGAAGATCCTGG
CCCACATGGACGATCTGAAGCTCTGGACCTGGCAAGGTGCGCACCGACCT
GCCCTGGAGGTGGACTTCGCCAAAAGGCCGGAGCCCGACCGGGAGAGGCTTAG
GGCCTTCTGGAGAGGGTTGAGTTGGCAGCCTCCACGAGTTGGCCTTCTG
20 GAAAGCCCCAAGGCCTGGAGGAGGCCCTGGCCCCCGCCGGAGGGCCTTC
GTGGCTTGTGCTTCCGCAAGGAGCCATGTGGCCGATCTCTGGCCCTGG
CCGCCGCCAGGGGGGCCGGTCCACCGGGCCCCGAGCCTATAAACCCCTCA
GGGACCTGAAGGAGGCGCGGGGCTCTGCCAAAGACCTGAGCGTTCTGGCCC
TGAGGGAGGCCTTGGCCTCCGCCCGACGACCCATGCTCTCGCCTACCT
25 CCTGGACCCCTCCAACACCACCCCGAGGGGTGGCCCGCTACGGCGGGGA
GTGGACGGAGGAGGCCGGAGCGGGCCCTTCCGAGAGGCTCTGGCCAA
CCTGTGGGGAGGCTTGAGGGGAGGAGAGGCTCTGGCTTACCGGGAGGT
GGAGAGGCCCTTCCGCTGTCCCTGGCCACATGGAGGCCACGGGGTGCCT
GGACGTGGCCTATCTCAGGGCCTGTCCCTGGAGGTGGCCGAGGAGATGCCCG
30 CCTCGAGGCCGAGGTCTCCGCCCTGGCCGCCACCCCTCAACCTCAACTCCGG
GACCAGCTGGAAAGGGCCTTTGACGAGCTAGGGCTCCGCCATGGCAAG
ACGGAGAAGACGGCAAGCGCTCCACCGGCCGCCGTGGAGGCCCTCCGC
GAGGCCACCCATCGTGAGAAGATCCTGCAGTACCGGGAGCTACCAAGCTG
AAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCAGGACGGCGCC

TCCACACCGCTTCAACCAGACGCCACGCCACGGCAGGCTAAGTAGCTCCG
 ATCCCAACCTCCAGAACATCCCCGTCCGCACCCGCTGGCAGAGGATCCGCCG
 GGCCTTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAGCCAGAT
 AGAGCTCAGGGTGCTGGCCCACCTCTCCGGCGACGAGAACCTGATCCGGTCTC
 5 CAGGAGGGCGGGACATCCACACGGAGACCGCCAGCTGGATGTTCGGCGTCCCC
 CGGGAGGCCGTGGACCCCTGATGCCCGGGCGCCAAGACCATAACTTCGGG
 GTCCTCTACGGCATGTCGGCCCACCGCCTCTCCAGGAGCTAGCCATCCCTTACG
 AGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTTCCAAAGGTGCGGGC
 CTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCAGGGTACGTGGAGACCC
 10 TCTTCGGCCGCCGCTACGTGCCAGACCTAGAGGCCGGGTGAAGAGCGTGC
 GGGAGGCCGAGCGCATGGCCTCAACATGCCGTCCAGGGCACCGCCCG
 ACCTCATGAAGCTGGCTATGGTAAGCTCTTCCCCAGGCTGGAGGAAATGGGGG
 CCAGGATGCTCCTTCAGGTCCACGACGAGCTGGCCTCGAGGCCAAAAGAGA
 GGGCGGAGGCCGTGGCCCGCTGGCCAAGGAGGTATGGAGGGGTGTATCCCC
 15 TGGCGTGCCCTGGAGGTGGAGGTGGGATAGGGAGGACTGGCTCTCCGCA
 AGGAGGGCATTGATGGCCGGCGAGGCGGGCATCATCATCATCATCATTAA

SEQ ID NO:6 The amino acid sequence of Sso7d-Taq fusion protein.

MITNSSATVKFKYKGEKEVDISKIKKVWRVGKMISFTYDEGGGKTGRGAVSEKDA
 20 PKELLQMLEKQKKGGVTSGMLPLFEPKGRVLLVDGHHLAYRTFHALKGLTSRGE
 PVQAVYGFAKSLLKALKEDGDAVIVVFDAKAPSFRHEAYGGYKAGRAPTPEDFPRQ
 LALIKELVDLLGLARLEVPGYEADDVLASLAKKAEKEGYEVRLTADKDLYQLLSDR
 IHVLHPEGYLITPAWLWEKYGLRPDWADYRALTGDESDNLPGVKIGEKTARKLL
 EEWGSLEALLKNLDRLKPAIREKILAHMDDLKLSWDLAKVRTDLPLEVDFAKRREP
 25 DRERLRAFLERLEFGSLLHEFGLESPKALEEAPWPPPEGAFVGFVLSRKEPMWADL
 LALAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREGLGLPPGDDPMILLA
 YLLDPSNTTPEGVARRYGGEWTEEAGERAALSERLFANLWGRLEGEERLLWLYREV
 ERPLSAVLAHMEATGVRLDVAYLRLSLEVAEEIARLEAEVFRLAGHPFNLNSRDQL
 ERVLFDELGLPAIGKTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTYIDPL
 30 PDLIHPRTGRLHTRFNQTATATGRLSSDPNLQNIPVRTPLGQRIRRAFIAEEGWLLVA
 LDYSQIELRVLAHLSGDENLIRVFQEGRDIHTETASWMFGVPREAVDPLMRRAAKTI
 NFGVLYGMSAHRSQLAIPYEEAQAFIERYFQSFPKVRAWIEKTLEEGRRRGYVETL
 FGRRRYVPDLEARVKSvreAAERMAFNMPVQGTAADLMKLAMVKLFPRLEEMGA

RMLLQVHDELVLEAPKERAEEAVARLAKEVMEGVYPLAVPLEVEVGIGEDWLSAKE
GIDGRGGGGHHHHHH

SEQ ID NO:7 The DNA sequence encoding the Pfu-Sso7d fusion protein

5 ATGATTTAGATGTGGATTACATAACTGAAGAAGGAAAACCTGTTATTAGGCTAT
TCAAAAAAGAGAACGGAAAATTAAAGATAGAGCATGATAGAACTTTAGACC
ACATTTACGCTCTCAGGGATGATTCAAAGATTGAAGAAGTTAAGAAAATAAC
GGGGAAAGGCATGGAAAGATTGTGAGAATTGTTGATGTAGAGAAGGTTGAGAA
AAAGTTCTCGCAAGCCTATTACCGTGTGGAAACTTATTGGAACATCCCCAA
10 GATGTTCCCACATTAGAGAAAAAGTTAGAGAACATCCAGCAGTTGTGGACATCT
TCGAATACGATATTCCATTGCAAAGAGACCTCATCGACAAAGGCCTAATACC
AATGGAGGGGAAGAACAGAGCTAAAGATTCTGCCTCGATATAGAAACCCTCTA
TCACGAAGGAGAACAGAGTTGGAAAAGGCCAATTATAATGATTAGTTATGCAGA
TGAAAATGAAGCAAAGGTGATTACTTGGAAAAACATAGATCTCCATACGTTGA
15 GGTTGTATCAAGCGAGAGAGAGATGATAAAGAGATTCTCAGGATTATCAGGGA
GAAGGATCCTGACATTATAGTTACTTATAATGGAGACTCATTGACTTCCATAT
TTAGCGAAAAGGGCAGAAAACCTGGGATTAAATTAACCATTGGAAGAGATGGA
AGCGAGCCAAGATGCAGAGAATAGGCATATGACGGCTGTAGAAGTCAAGGG
AAGAATACATTGACTTGTATCATGTAATAACAAGGACAATAATCTCCAAACA
20 TACACACTAGAGGCTGTATATGAAGCAATTGGAAAGCCAAGGAGAACGGTA
TACGCCGACGAGATAGCAAAAGCCTGGAAAGTGGAGAGAACCTTGAGAGAGTT
GCCAAATACTCGATGGAAGATGCAAAGGCAACTTATGAACTCGGGAAAGAAC
CTTCCAATGGAAATTCAAGCTTCAAGATTAGTTGGACAACCTTATGGGATGTT
CAAGGTCAAGCACAGGGAACCTGTAGAGTGGTTCTACTTAGGAAAGCCTACG
25 AAAGAAACGAAGTAGCTCAAACAAGCCAAGTGAAGAGGGAGTCAAGAGG
CTCAGGGAGAGCTACACAGGTGGATTGTTAAAGAGGCCAGAAAAGGGTTGTGG
GAAAACATAGTACCTAGATTAGGCCCTATATCCCTCGATTATAATTACCC
ACAATGTTCTCCGATACTCTAAATCTGAGGGATGCAAGAACTATGATATCGC
TCCTCAAGTAGGCCACAAGTTCTGCAAGGACATCCCTGGTTTATACCAAGTCTC
30 TTGGGACATTGTTAGAGGAAAGACAAAAGATTAAGACAAAATGAAGGAAACT
CAAGATCCTATAGAAAAAAACTCCTGACTATAGACAAAAGCGATAAAACTC
TTAGCAAATTCTTCTACGGATATTATGGCTATGCAAAAGCAAGATGGTACTGTA
AGGAGTGTGCTGAGAGCGTTACTGCCTGGGAAGAAAGTACATCGAGTTAGTAT
GGAAGGAGCTCGAAGAAAAGTTGGATTAAAGTCCTCTACATTGACACTGATG

GTCTCTATGCAACTATCCCAGGAGGAGAAAGTGAGGAAATAAAGAAAAAGGCTC
TAGAATTGTAAAATACATAAATTCAAAGCTCCCTGGACTGCTAGAGCTTGAATA
TGAAGGGTTTATAAGAGGGATTCTCGTTACGAAGAAGAGGTATGCAGTAAT
AGATGAAGAAGGAAAAGTCATTACTCGTGGTTAGAGATAGTTAGGAGAGATTG
5 GAGTGAAATTGCAAAAGAAACTCAAGCTAGAGTTGGAGACAATACTAAAACA
CGGAGATGTTGAAGAAGCTGTGAGAATAGTAAAGAAGTAATACAAAAGCTTGC
CAATTATGAAATTCCACCAGAGAACGCTCGCAATATGAGCAGATAACAAGACC
ATTACATGAGTATAAGGCAGATAGGTCTCACGTAGCTGTTGCAAAGAAACTAGCT
GCTAAAGGAGTTAAAATAAGCCAGGAATGGTAATTGGATACATAGTACTTAGA
10 GGCATGGTCCAATTAGCAATAGGGCAATTCTAGCTGAGGAATACGATCCAAA
AAGCACAAGTATGACGCAGAATATTACATTGAGAACCAAGGTTCTCCAGCGGT
CTTAGGATATTGGAGGGATTGGATACAGAAAGGAAGACCTCAGATACCAAAAG
ACAAGACAAGTCGGCTAACTCCTGGCTAACATTAAAAATCCGGTACCGGC
GGTGGCGGTGCAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAGAGGTAGA
15 CATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCCTTCACCTAC
GACGAGGGCGGTGGCAAGACCGGCCGTGGTGGTAAGCGAAAAGGACGCGCC
GAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGTGA

SEQ ID NO:8 The amino acid sequence of the Pfu-Sso7d fusion protein

20 MILDVDYITEEGKPVIRLFKKENGKFIEHDRTFRPYIYALLRDDSKIEEVKKITGERH
GKIVRIVDVEKVEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFA
KRYLIDKGLIPMEEEELKILAFDIETLYHEGEFGKGPIIMISYADENEAKVITWKNID
LPYVEVVSSEREMIKRFLRIIREKDPIIVTYNGDSFDPYLAKRAEKLGIKLTIGRDGS
EPKMQRIGDMTAVEVKGRHIHFDLYHVITRTINLPTYTLEAVYEAFGKPKEKVYADEI
25 AKAWESENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLWDVRSSTGN
LVEWFLLRKAYERNEVAPNKPSEEEYQRRLRESYTGGFVKEPEKGLWENIVYLDFR
ALYPSIIITHNVSPDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLEERQKIKTK
MKETQDPIEKILLDYRQKAIKLLANSFYGYGYAKARWYCKECAESVTAWGRKYIE
LVWKELEEKFGFKVLYIDTDGLYATIPGGESEEIKKALEFVKYINSKLPGLLELEYE
30 GFYKRGFFVTKKRYAVIDEEGKVITRGLIEVRRDWSEIAKETQARVLETILKHGDVEE
AVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGVKIKPG
MViGYIVLRGDGPISNRAILAEYDPKKHKYDAEYYIENQVLP AVRILEGFGYRKED
LRYQKTRQVGLTSWLNIKSGTGGGGATVKFKYKGEEKEVDISKIKKVVWRVGKMS
FTYDEGGGKTGRGA VSEKDAPKELLQM LEKQKK

SEQ ID NO:9 The DNA sequence encoding the Sac7d-ΔTaq fusion protein

ATGATTACGAATTCGACGGTGAAGGTAAAGTTCAAGTATAAGGGTGAAGAGAAA
GAAGTAGACACTCAAAGATAAAGAAGGTTGGAGAGTAGGCCAAATGGTGTCC
5 TTTACCTATGACGACAATGGTAAGACAGGTAGAGGAGCTGTAAGCGAGAAAGAT
GCTCCAAAAGAATTATTAGACATGTTAGCAAGAGCAGAAAGAGAGAAGAAAGG
CGGCGGTGTCAGTCCCAAGGCCCTGGAGGAGGCCCTGGCCCCCGCCGA
AGGGGCCTCGTGGCTTGTGCTTCCGCAAGGAGCCCATGTGGCCGATCTT
CTGGCCCTGGCCGCCAGGGGGCCGGTCCACCGGGCCCCGAGCCTTAT
10 AAAGCCCTCAGGGACCTGAAGGAGGGCGGGGGCTCTCGCCAAAGACCTGAGC
GTTCTGGCCCTGAGGGAAAGGCCTGGCCTCCGCCGGCGACGACCCATGCTCC
TCGCCTACCTCCTGGACCCTTCCAACACCAACCCCCGAGGGGGTGGCCCGCGCTA
CGGCGGGAGTGGACGGAGGAGGCGGGGAGCGGGCCCTTCCGAGAGGC
TCTTCGCCAACCTGTGGGGAGGCTTGAGGGGGAGGAGAGGCTCCTTGGCTTA
15 CCGGGAGGTGGAGAGGCCCTTCCGCTGTCCTGGCCCACATGGAGGCCACGGG
GGTGCCTGGACGTGGCCTATCTCAGGGCCTGTCCTGGAGGTGGCCGAGGA
GATCGCCCGCCTCGAGGCCGGTCTCCGCCCTGGCCGGCACCCCTCAACCTCA
ACTCCCGGACCAGCTGGAAAGGGCCTCTTGACGAGCTAGGGCTCCGCCAT
CGGCAAGACGGAGAAGACCGCAAGCGCTCCACCAGCGCCGCCGTGGAGGC
20 CCTCCCGAGGCCACCCATCGTGGAGAAGATCCTGCAGTACCGGGAGCTCAC
CAAGCTGAAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCCAGGACG
GGCCGCCTCCACACCCGCTTCAACCAGACGCCACGCCACGGCAGGCTAAGT
AGCTCCGATCCAACCTCCAGAACATCCCCGTCCGCACCCCGCTTGGCAGAGGA
TCCGCCGGGCCTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAG
25 CCAGATAGAGCTCAGGGTGCTGGCCACCTCTCCGGCGACGAGAACCTGATCCG
GGTCTCCAGGAGGGCGGGACATCCACACGGAGACGCCAGCTGGATGTCGG
CGTCCCCCGGGAGGCCGTGGACCCCTGATGCCGCCGGCGGCCAACGACCATCAA
CTTCGGGGCCTCTACGGCATGTCGCCACCGCCTCTCCAGGAGCTAGCCATC
CCTTACGAGGAGGCCAGGCCTTCAATTGAGCGCTACTTCAGAGCTCCCCAAGG
30 TGCGGGCCTGGATTGAGAACGCCCTGGAGGAGGGCAGGAGGCCGGTACGTG
GAGACCCCTTCGCCGCCGCGCTACGTGCCAGACCTAGAGGCCGGTGAAG
AGCGTGGAGGCCAGGCATGGCCTCAACATGCCGTCCAGGGCACC
GCCGCCACCTCATGAAGCTGGCTATGGTAAGCTCTCCCCAGGCTGGAGGAA

ATGGGGGCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGTCCTCGAGGCCCA
 AAAGAGAGGGCGGAGGCCGTGGCCCGGCTGGCCAAGGAGGTATGGAGGGGGT
 GTATCCCCCTGGCCGTGCCCTGGAGGTGGAGGGATAGGGGAGGACTGGCT
 CTCCGCCAAGGAGGGCATTGATGGCCGCGGAGGCAGGCATCATCATCATCA

5 TCATTAA

SEQ ID NO:10 The amino acid sequence of the Sac7d-ΔTaq fusion protein

MITNSTVKVKFKYKGEEKEVDTISKIKVVWRVGKMSFTYDDNGKTGRGA
 VSEKDAPKELLDMLARAEREKKGGGVTPKALEEAPWPPPEGAFVGFVLSR
 KEPMWADLLAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREG
 LGLPPGDDPMLLAYLLDPSNTTPEGVARRYGGEWTEEAGERAALSERLF
 ANLWGRLEGEERLLWLYREVERPLSAVLAHMEATGVRLDVAYLALS
 LEVAEIIDARLEAEVFRLAGHPFNLNSRDQLERVLFDELGLPAIG
 KTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTYIDPLPD
 LIHPRTGRLHTRFNQTATATGRLSSSDPNLQNPVRTPLGQRIRRAFIA
 EEGWLLVALDYSQIELRVLAHLSGDENLIRVFQEGRDIHTETASWMFG
 VPREADPLMRRAKTINFGVLYGMSAHRLSQELAIPYEEAQAFIERYF
 QSFPKVRAWIEKTLEEGRRGYVETLFGRRYYVPDLEARVKSVREA
 ERMAFNMPVQGTAADLMKLAMVKLFPRLEEMGARMLLQVHDELV
 LEAPKERAEEAVARLAKEVMEGVYPLAVPLEVEVGIGEDWLSAKE
 GIDRGGGGHHHHHH

20

SEQ ID NO:11 The DNA sequence encoding the PL-ΔTaq fusion protein

ATGATTACGAATTCAAGAAAAAGAAAAAGAAAAAGCGTAAGAACGCAAAA
 GAAAAAGAAAGCGCCGGTGTCACTAGTGGCGCAACCGTAAAGTTCAAGTACA
 AGCGAAGAAAAAGAGGTAGACATCTCCAAGATCAAGAAAGTATGGCGTGT
 GG25GCAAGATGATCTCCTCACCTACGACGAGGGCGGTGGCAAGACCGGCC
 CGGTAAAGCAGAAAGGACGCGCCGAAGGAGCTGCTGCAGATGCTGGAGA
 AGCAGAAAAAGGGCGCCGGTGTCAACCAGTCCAAGGCCCTGGAGGAGGCC
 CCGCCGGAAGGGGCCTCGTGGCTTGCTTCCGCAAGGAGCCCATTGTGG
 CCGATCTCTGCCCTGCCGCCGCCAGGGGGGCCGGTCCACCGGGCCCCG
 30AGCCTTATAAAGCCCTCAGGGACCTGAAGGAGGCGGGGGCTCTGCC
 AAAGACCTGAGCGTTCTGCCCTGAGGGAAAGGCCTGGCTCCGCCGG
 GACGACCCCATGCTCCTGCCCTACCTCCTGGACCCTCCAACACCAC
 CCCCCGAGGGGGTGGCCCGCGCTACGGCGGGAGTGGACGGAGGAGG
 AGCGGGGCCCTTCC

GAGAGGCTTCGCCAACCTGTGGGGAGGCTTGAGGGGAGGAGAGGCTCCTT
 TGGCTTACCGGGAGGTGGAGAGGCCCTTCCGCTGCCTGGCCCACATGGAGG
 CCACGGGGTGCCTGGACGTGGCTATCTCAGGGCCTGCCCCGGAGGTGGC
 CGAGGAGATGCCCGCCTCGAGGCCAGGTCTCCGCCCTGGCCGGCACCCCTC
 5 AACCTCAACTCCGGGACCAGCTGGAAAGGGCCTCTTGACGAGCTAGGGCTTC
 CCGCCATCGGCAAGACGGAGAAGACCGGAAGCGCTCCACCAGGCCGCCGTCC
 TGGAGGCCCTCCCGAGGCCACCCATCGTGAGAAGATCCTGCAGTACCGGG
 AGCTCACCAAGCTGAAGAGCACCTACATTGACCCCTGCCGACCTCATCCACCC
 CAGGACGGGCCGCTCCACACCCGCTCAACCAGACGCCACGGCACGGCAG
 10 GCTAAGTAGCTCGATCCCAACCTCCAGAACATCCCCGTCCGCACCCGCTGGG
 CAGAGGATCCGCCGGCCTTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTG
 GACTATAGCCAGATAGAGCTCAGGGTGCTGGCCACCTCTCCGGCAGCAGAAC
 CTGATCCGGGTCTTCAGGAGGGCGGGACATCCACACGGAGACGCCAGCTGG
 ATGTTCGCGTCCCCGGAGGCCGTGGACCCCTGATGCCGCCGGCGCCAAG
 15 ACCATCAACTCGGGTCCTCTACGGCATGTCGGCCCACCGCCTCTCCAGGAGC
 TAGCCATCCCTACGAGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTT
 CCCAAGGTGCCGGCCTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCC
 GGTACGTGGAGACCCCTTCGGCCGCCGCTACGTGCCAGACCTAGAGGCC
 GGGTGAAGAGCGTGGGGAGGCCGAGCGCATGCCCTCAACATGCCGTCC
 20 AGGGCACCGCCGCCACCTCATGAAGCTGGCTATGGTAAGCTCTCCCCAGGCT
 GGAGGAAATGGGGGCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGCCTCGA
 GGCCCCAAAAGAGAGGGCGGAGGCCGTGGCCGGCTGGCCAAGGAGGTATGG
 AGGGGGTGTATCCCCTGGCCGTGCCCTGGAGGTGGAGGTGGGGATAGGGAGG
 ACTGGCTCTCCGCCAAGGAGGGCATTGATGCCGCCGGAGGCAGGATCATC
 25 ATCATCATCATTAA

SEQ ID NO:12 The amino acid sequence of PL- Δ Taq fusion protein

MITNSKKKKKKRKKKKKKKGVTSGATVKFKYKGEKEVDISKIKKVWRVGK
 MISFTYDEGGGKTGRGAVSEKDAPKELLQMLEQKKGGVTSPKALEEAAPWPPPEG
 30 AFVGFVLSRKEPMWADLLALAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVL
 ALREGLGLPPGDDPMLLAYLLDPSNTTPEGVARRYGGEWTEEAGERAALSERLFAN
 LWGRLEGEERLLWLWYREVERPLSAVLAHMEATGVRLDVAYLRALSLEVAEEIARLE
 AEVFRLAGHPFNLNSRDQLERVLFDELGLPAIGKTEKTGKRSTSAAVLEALREAHPIV

EKILQYRELTKLKSTYIDPLPDLIHPRTGRLHTRFNQTATATGRLSSSDPNLQNIPVRTP
LGQRIRRAFIAEEGWLLVALDYSQIELRVLAHLSGDENLIRVFQEGRDIHTETASWMF
GVPREAVDPLMRRAAKTINFGVLYGMSAHRLSQELAIPYEEAQAFIERYFQSFPKVR
AWIEKTLEEGRRRGYVETLFGRRRYVPDLEARVKSvreAAERMAFNMPVQGTAAD
5 LMKLAMVKLFPRLEEMGARMLLQVHDELVLEAPKERAEEAVARLAKEVMEGVYPL
AVPLEVEVGIGEDWLSAKEGIDGRGGGGHHHHHH

SEQ ID NO:13 PRIMER L71F

5'-CCTGCTCTGCCGCTTCACGC-3'

10

SEQ ID NO:14 PRIMER L71R

5'-GCACAGCGGCTGGCTGAGGA-3'

TODD E SMO "20002860"

SEQ ID NO:15 PRIMER L18015F

15 5'-TGACGGAGGATAACGCCAGCAG-3'

SEQ ID NO:16 PRIMER L23474R

5'-GAAAGACGA TGGGTCGCTAACATACGC-3'

20 **SEQ ID NO:17 PRIMER L18015F**

5'-TGACGGAGGATAAC GCCAGCAG-3'

SEQ ID NO:18 PRIMER L29930R

5'-GGGTTGGAGGTCAATGGGTTTC-3'

25

SEQ ID NO:19 PRIMER L30350F

5'-CCTGCTCTGCCGCTTCACGC-3'

SEQ ID NO:20 PRIMER L35121R

30 5'-CACATGGTACAGCAAGCCTGGC-3'

SEQ ID NO:21 PRIMER L2089F

5'-CCCGTATCTGCTGGGA TACTGGC-3'

SEQ ID NO: 22 PRIMER L7112R

5'-CAGCGGTGCTGACTGAATCATGG-3'

SEQ ID NO:23 PRIMER L30350F

5' 5'-CCTGCCTGCCGCTTCACGC-3'

SEQ ID NO:24 PRIMER L40547R

5'-CCAATACCCGTTCA TCGCGGC-3'

10 **SEQ ID NO:25 PRIMER H-Amelo-Y**

5'-CCACCTCATCCTGG GCACC-3'

SEQ ID NO:26 PRIMER H-Amelo-YR

5'-GCTTGAGGCCAACCATCAGAGC-3'

15

SEQ ID NO:27 Human beta-globin primer 536F

5'-GGTTGGCCAATCTACTCCCAGG-3'

20

SEQ ID NO:28 Human beta-globin primer 536R

5'-GCTCACTCAGTGTGGCAAAG-3'

SEQ ID NO:29 Human beta-globin primer 1408R

5'-GATTAGCAAAAGGGCCTAGCTTGG-3'

25